HANDHELD DIGITAL STORAGE OSCILLOSCOPE & MULTIMETER

CE USB DMM PC Software

GDS-122 (20MHz)

FEATURES

- 20 MHz Bandwidth
- 100 MS/s Realtime Sampling Rate
- Digital Storage Oscilloscope & Multimeter
- True RMS Multimeter Volts, Amps, Ohms, Continuity, Diode
- Dual Independant Floating Isolated Channels (for Multimeter and Between Oscilloscope and Multimeter)
- Trigger Modes Free Run, Single Shot, Edge, Video
- USB Interfaces
- 6 Hour Capacity Li-ion Rechargeable Battery
- 3.8" Color LCD, Resolution: 320 × 240
- Light Weight at 690g

Two-In-One Function : Dual Channel Oscilloscope and True RMS DMM

GDS-122 is a multi-function measurement tool. By using the oscilloscope functionalities , you can measure simple waveforms, use advanced measurement functions, and configure system settings. The multimeter functionality includes three major items (Voltage, Current, and Impedance) and three additional items (Diode, Continuity, and Capacitance). The current measurement and capacitance measurement use extension modules to deal with large current and small capacitance, respectively. Delta measurement and automatic range switching features offer flexibility and convenience.

Dual Waveform Math

The waveform math function runs mathematical operations between CH1 and CH2 waveform, and then shows the result in the display. It offers 5 math function, CH1-CH2, CH2-CH1, CH1+CH2, CH1 x CH2, CH1/CH2.

Automatic Measurement

The automatic measurement function measures the input signal's characteristics and lists them in the top left corner of the display. The measurement items are Frequency, Period, Mean Voltage, Peak-to-Peak Voltage, Cycle Voltage (True RMS).

Autoset Function

The autoset function automatically configures the following parameters according to the input signal. It can offer CH1/CH2 on/off, Vertical scale/level, Horizontal scale/level, Trigger level.

Self Calibration

The self calibration function automatically configures internal parameters to maintain the sensitivity and accuracy. Run the self calibration in the following cases.
When the temperature changes more than 5 degrees Celsius during operations
When operating the GDS-122 in a new benchtop or field environment.

6 Hours Running Time Li-ion Battery & Very Light Weight

GDS-122 is equipped with a Li-ion battery, which is able to maintain its normal operation for about 6 hours. After pressing the power key, press any key (for example the MENU key) to enter the oscilloscope or multimeter mode. See the battery level icon at the top left corner of the display and connect the power cord if the level is < 25%. With only 690g light weight and compact size, GDS-122 well fits into outdoor applications.

Free PC Software

The GDS-122 PC software, included in the CD-ROM, allows you to view the waveforms in your familiar PC environment large display and mouse operation. Multiple cursors provide flexible waveform measurements. The PC Software is through from USB connection.

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APPLICATIONS

- Automotive Testing
- Electric Cooling Fans Maintain & Development
- Industrial Troubleshooting
- Installation Maintain
- Circuit Repair & Debug

SPECIFICATIONS

VERTICAL	**Analog Digital Converter A/D**	With the resolution of 8 bits,make sampling on both channels synchronously
	Sensitivity Range V/div	5mV/div 5V/div at the input BNC
	Displacement Range	±50V(500mV 5V), ±1V(5mV 200mV)
	Analog Bandwidth	20MHz
	Single Bandwidth	Full bandwidth
	Low Frequency Response AD Coupling,-3dB	±5Hz at the BNC
	Rise Time Typical One at the BNC	17.5ns
	DC Gain Accuracy	±5%
	DC Measurement Accuracy Average Value Sampling Mode	The voltage difference (V) between any two points on the waveform after averaging the captured waveforms more than16: ±(5% reading + 0.05 divisions)
TRIGGER	**Trigger Sensitivity Edge Triggering**	DC coupling : CH1 and CH2: 1div (DC full bandwidth) AC coupling : Same as the DC coupling when it is equal to or larger than 50Hz
	Triggering Lever Range	±6 divisions from the screen center
	Triggering Level Accuracy (Typical)	±0.3 divisions
	Trigger Displacement	655 divisions for pre-triggering and 4 divisions for post- triggering
	Make a 50% Level Setting (Typical)	Operation with the input signal frequency equal to or larger than 50Hz
	Trigger Sensitivity	2 divisions of peak-to-peak value
	Signal System and Line/Field Frequency	Support the NTSC, PAL and SECAM broadcasting systems of any field or line frequency
HORIZONTAL	**Sampling Rate Range**	10S/s~100MS/s
	Waveform Interpolation	sin x / x
	Record Length	6K points on each channel
	Scanning Speed Range S/div	5ns/div 5s/div, stepping in the "1-2.5-5" mode.
	Sampling Rate and Relay Time Accuracy	±100ppm(any time interval which is equal to or larger than 1ms)
	Time Interval (T)Measurement Accuracy Full Bandwidth	Single: ±(1 sampling interval time+100ppm×reading+0.6ns) >average 16 : ±(1 sampling interval time +100ppm×reading+0.4ns)
INPUT	**Input Coupling**	DC, AC
	Input Impedance	1MΩ±2% connected in parallel with 20pF±3pF
	Probe Attenuation Coefficient	1X, 10X, 100X, 1000X
	Max. Input Voltage	400V (peak)
	Channel Delay Time (Typical)	150ps
SAMPLING	**Sampling Modes**	Normal sampling Peak detection Average value
	Sampling Rate	100 MSa/s
MEASUREMENT	**Cursor Measurement**	Voltage difference (V) and time difference (T) between cursors
	Auto Measurement	Peak-to-peak value,average value,root mean square value,frequency and cycle
MULTIMETER SPECIFICATIONS	**Input Impedance**	10MΩ
	Voltage	VDC: 400mV, 4V, 400V ±(1% +1 digit)
	Max Input	DC 400V
	VAC	4V, 40V, 400V ±(1% +3 digit)
	Frequency	40Hz ~ 400Hz
	Max Input	AC 400V (Virtual value)
	Current	DCA : 40mA, 400mA ±(1.5% +1 digit); 20A: ±(3% +3 digit) DAA : 40mA ±(1.5% +3 digit), 400mA ±(2% +1 digit); 20A: ±(5% +3 digit)
	Impedance	400Ω ±(1%+3 digit), 4KΩ, 40KΩ, 400KΩ, 4MΩ ±(1%+1 digit), 40MΩ ±(1.5%+3 digit)
	Capacitance	51.2nF ~ 100uF ±(3%+3 digit)
	Diode	0V ~ 1.5V On/Off measurement < 50 (±30) beeping
GENERAL SPECIFICATIONS	**Display**	Display type : 3.8" color liquid crystal display Display resolution : 320 (horizontal) x 240 (vertical) pixels Display color : 4096 colors
	Power Adapter	Power supply : 100-240 VAC, 50/60Hz, CAT II ; Power consumption : < 6W
	Operating Temperature	Used battery : 0~50 °C (32~122 °F);Power adapter : 0~40 °C (32~104 °F)

Note : (*)USE "REL" Mode

Specifications subject to change without notice. DS-1220GD1DH

ORDERING INFORMATION

GDS-122 Handheld Digital Storage Oscilloscope & Multimeter

ACCESSORIES:
User Manual x 1, Probe x 2, Multimeter test lead x 2, AC-DC adaptor x 1,
Probe adjustment tool x 1, Soft Carrying case x 1, 1kHz square wave cable x 1,
Extension module for large current measurement x 1,
Extension module for small capacitance measurement x 1,
USB communication cable x 1, CD-ROM (PC software) x 1

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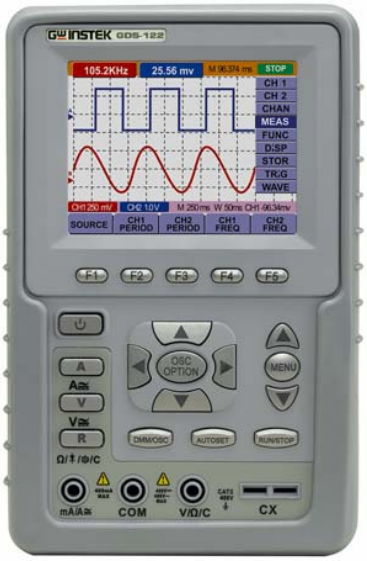
GDS-122 20MHz Handheld Digital Oscilloscope

New Product Announcement

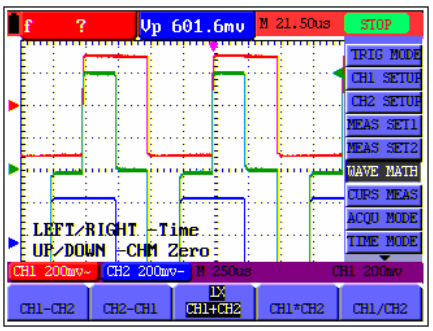
GDS-122 is GW Instek's first handheld oscilloscope launched to the market. It is equipped with 3.8-inch color LCD, which is helpful to clearly show 2 different channel waveforms at one display. Its 100 MSa/s real-time sampling rate and Dual Waveform Math (DWM) function provide users with the fast waveform analyzing capability. What's more, the additional 6k memory brings the GDS-122 with the impressive accurate data-capturing capability to satisfy diverse industrial requirements. Besides, the DMM mode offers 3 ¾ build-in 4,000 count digital multimeter and auto/manual range adjusting function. No matter in the situation like dealing with voltage, electric current, resistance, diode or even auxiliary measuring, GDS-122 helps obtaining precise information without any delay.



GDS-122 Main Features

- **Dual Mode: Oscilloscope and Multimeter**

GDS-122 is a multi-function measurement tool. By using the oscilloscope functionalities, you can measure simple waveforms, use advanced measurement functions, and configure system settings. The multimeter functionality includes three major items (Voltage, Current, and Impedance) and three additional items (Diode, Continuity, and Capacitance). The current measurement and capacitance measurement use extension modules to deal with large current and small capacitance, respectively. Delta measurement and automatic range switching features offer flexibility and convenience.

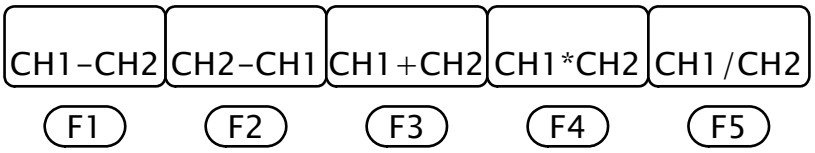


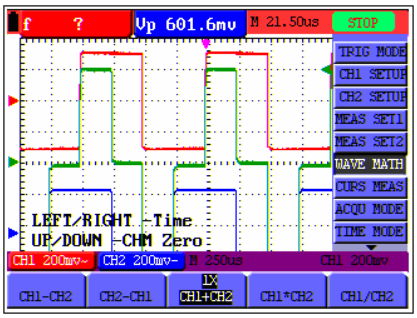
Oscilloscope Mode

Multimeter Mode

▪ Waveform Math Function

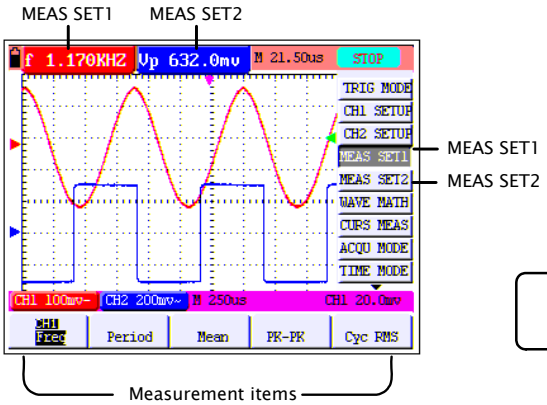
The waveform math function runs mathematical operations between CH1 and CH2 waveform, and then shows the result in the display. It offers 5 math function, CH1-CH2, CH2-CH1, CH1+CH2, CH1*CH2, and CH1/CH2.



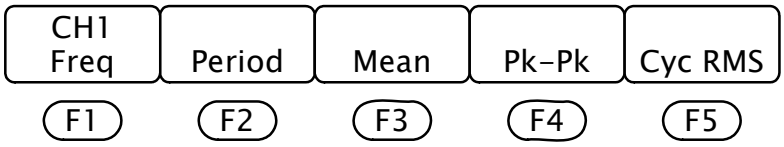


CH1+CH2 Math

▪ Automatic Measurement Function

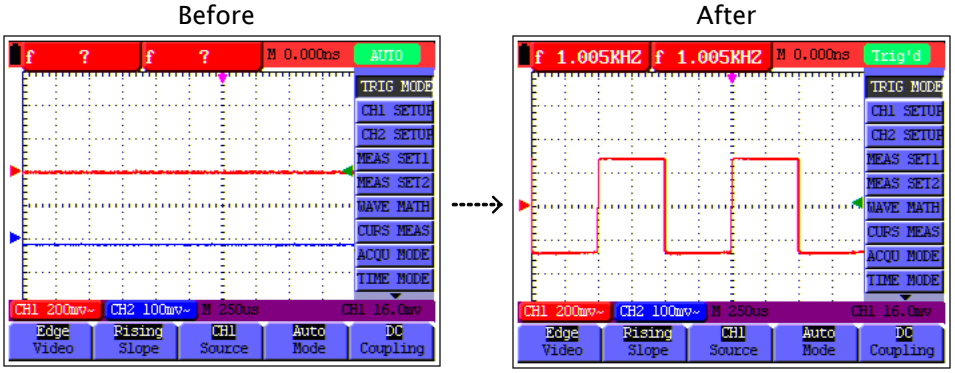


The automatic measurement function measures the input signal's characteristics and lists them in the top left corner of the display. The measurement items are Frequency, Period, Mean Voltage, Peak-to-Peak Voltage, and Cycle Voltage (True RMS).



▪ Autoset Function

The Autoset function automatically configures the following parameters according to the input signal. It can offer CH1/CH2 on/off, Vertical scale/level, Horizontal scale/level, Trigger level.



▪ 6 Hours Running Time Li-ion Battery & Light Weight

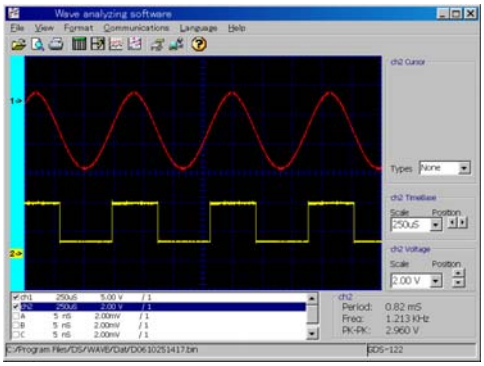
GDS-122 is equipped with a Li-ion battery, which is able to maintain its normal operation for about 6 hours. After pressing the power key, press any key (for example the MENU key) to enter the oscilloscope or multimeter mode. See the battery level icon at the top left corner of the display. With only 690g light weight and compact

size, GDS-122 well fits into outdoor applications.

> 75%	75%	50%	25%	< 25%

Battery Level Icon

- **Free PC Software**

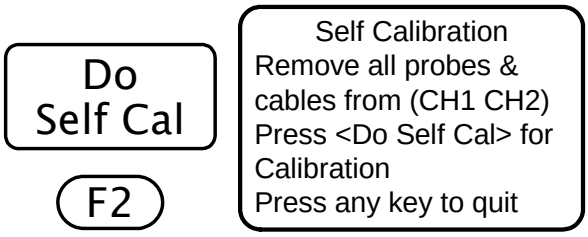


The GDS-122 PC software, included in the CD-ROM, allows you to view the waveforms in your familiar PC environment – large display and mouse operation. Multiple cursors provide flexible waveform measurements. The PC Software is through from USB connection.

- **Self Calibration**

The self calibration function automatically configures internal parameters to maintain the sensitivity and accuracy. Run the self calibration in the following cases.

- When the temperature changes more than 5 degrees Celsius during operations
- When operating the GDS-122 in a new benchtop or field environment



Self Calibration

GDS-122 Product Description

GDS-122, 20MHz Handheld Digital Oscilloscope

Key Features

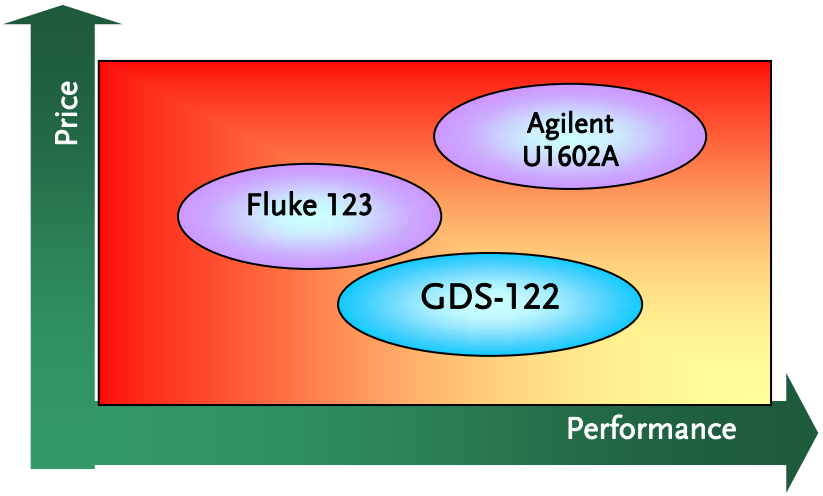
- **Oscilloscope**
  - Dual channel
  - 20MHz bandwidth
  - 100MS/s real-time sampling rate
  - ≤ 17.5ns rising time
  - 5ns to 5s/div horizontal scale
  - 5mV to 5V/div vertical scale
  - 6k memory points per channel
  - Dual waveform math with +, -, x, /
  - Autoset function
  - Trigger mode: Auto, Free run, Single shot, Edge, Video
  - 2 cursors
  - 5 automatic measurements
  - 4 display image memories
  - Self-calibration function
- **Multimeter**
  - Volts, Amps, Ohms, Continuity, Diode, Capacitance measurement
  - 20A maximum amplitude
  - True RMS measurement
- **Common**
  - Isolated inputs between oscilloscope and multimeter
  - USB & RS-232C interface
  - 1kHz square wave output
  - Free PC Software
  - 3.8 inch color LCD display, 320 x 240 resolution
  - 6 hours running time Li-ion battery
  - 180mm x 113mm x 40mm compact size
  - 690g light weight

GDS-122 Product Position

The GDS-122 product position could be seen from the following two aspects:

1. Pricing & Competition Position

The list price of GDS-122 is set as follows for the basic unit without any options. From the chart under you will easily see that GDS-122 locates in the middle position of performance/price value. Besides price advantage, GDS-122 stays at the level of moderate performance, which adequately covers most of the applications in the manufacturing and the service markets, whereas most of the competitors stand within a crowded range of high price.



Spec.	GDS-122	Fluke 123	Agilent U1602A
Bandwidth	20MHz	20MHz	20MHz
Input Channel	2	2	2
Sampling Rate	100M/sinx(x)	25M/1.25G(ET)	200 MSa/s
Record Length	6k	0.5k	125K
Time/Div.	**5ns~5s**	10ns~60s	50ns~50s
Voltage/Div.	5mV~5V	5mV~500V	5 mV~100V
DC Gain Accuracy	5%	1%	5%
Battery	YES	YES	YES
Color	**YES**	NO	YES
Peak Detect	**YES**	NO	YES
Roll/Scan (Low frequency)	**YES**	YES	
Cursor	YES	YES	YES
FFT	NO	NO	YES
Auto Measurement	5 items	NO	22 items
Max. Input	400V CATII	1250V CATIII	300V CATIII
DMM Function	YES	YES	YES
DMM Range (Max. VDC)	400V	1250V	600V
Full Scale Count	4000	5000	6000
USB	**YES**	NO	YES
RS-232C	**YES**	YES	NO
Weight	**690g**	1.2kg	1.5kg

2. Completeness of GW Product Line

GW Instek has been developing Digital Oscilloscope for many years, starting from GDS-800 Series to GDS-2000/1000 Series and now to handheld oscilloscope GDS-122. We expect the elevated brand image through GDS-122 announcement will bring benefit not just to GW Instek but to its partners as well.

Market Strategy

1. Focus on the targeted markets of installation and verification for the transformer, power supply, and automobile manufacturers. These industries do not require high frequency capability, but they do need outdoor testing and measuring capability.
2. Focus on low frequency (<20MHz) user range and for those who need to the outdoors or no ac power source testing/measuring environment. However, if the customers need higher accuracy and higher frequency capability, they would need to use GDS-2000 series products.
3. The product line of the original GDS-2000/1000/800 is expanded after the GDS-122 is added in.

Key Dates for Product Announcement

1. Order Queue Open (End of Nov.)
2. Distributor Announcement (Beg. of Dec.)
3. Global Market Announcement (Beg. of Dec.)
4. Demo Units Shipped to Distributors (Mid. of Dec.)
5. Mass Quantity Order Fulfillment (Mid. of Dec.)

Service Policy

1. GDS-122 caries **1-year** warranty. The exception is for the Li-ion Battery, which carries a **3-months** warranty.

2. **Service Support.**
   The service instructions in the Service Manual will help distributors repairing defective units promptly. Should the board replacement is necessary to fix the defective unit, the board swapping service support is provided by Good Will Instrument to facilitate the repair jobs done at the distributor's site.

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Email: marketing@goodwill.com.tw

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Specifications

Oscilloscope	Vertical	Channels	2	
		Bandwidth	DC ~ 20M (-3dB)	
		A/D converter	8 bits resolution (2CH simultaneously)	
		Sensitivity	5mV/div～5V/div（at input）	
		Displacement	±50V(500mV～5V),±1V(5mV～200mV)	
		Single	Full bandwidth	
		Low frequency	≥5Hz（at input, AD coupling, -3dB）	
		Rise time	≤17.5ns (at input, typical)	
		DC accuracy	±5% (DC gain)	
		DC accuracy (avg.)	Avg >16: ±(5% rdg + 0.05 div) for △V	
		Waveform Signal Process	+, -, *, /	
	Trigger	Sensitivity	CH1 and CH2: 1div(DC～full bandwidth) DC coupling: ≥ 50Hz.	
		Trigger level	±6 divisions from the screen center	
		Level accuracy	±0.3 div (typical, rise/fall time ≥ 20ns)	
		Displacement	655div (pre-trigger), 4div (post- trigger)	
		50% level setting	Input signal frequency ≥ 50Hz (typical)	
		Trigger sensitivity	2 div of peak-to-peak (video trigger)	
		Signal system	NTSC, PAL, SECAM (any frequency)	
	Horizontal	Sampling rate	10S/s～100mS/s	
		Interpolation	(sin x) /x	
		Record length	6K points on each channel	
		Scanning speed	5ns/div～5s/div, 1-2.5-5 step	
		Sampling rate / relay time accuracy	±100ppm (time interval ≥ 1ms)	
		Interval (△T) accuracy (full bandwidth)	Single: ±(1 interval time +100ppm×reading + 0.6ns) Average >16 : ±(1 interval time +100ppm×reading+0.4ns)	
	Sampling	Mode	Normal, Peak detection, Average	
		Rate	100 MSa/s	
	Input	Coupling	DC, AC	
		Impedance	1MΩ±2% in parallel with 20pF±3pF	
		Probe	1X, 10X, 100X, 1000X	
		Max. Input	400V (peak)	
		Channel delay	150ps (typical)	
	Measurement	Cursor	△V and △T between cursors	
		Automatic	Peak-to-peak, average, root mean square, frequency, and cycle.	
	Probe		1X position	10X position
		Bandwidth	≤ 6 MHz (DC)	Full bandwidth (DC)
		Attenuation rate	1: 1	10: 1
		Compensation	10pf～35pf	10pf～35pf
		Input impedance	1MΩ±2%	10MΩ±2%
		Input impendence	85pf～115pf	14.5pf～17.5pf
		Input voltage	150 V DC	300V DC
Multimeter	VDC	Input impedance	10MΩ	
		Max. input	1000V (DC or AC peak-to-peak value)	
		Accuracy	±1%±1 digit	
		Resolution	400mV range: 100uV 4V range: 1mV 40V range: 10mV 400V range: 100mV	

	VAC	Input impedance	10MΩ
		Max. input	750V(AC, virtual value)
		Frequency range	40Hz~400Hz
		Display	Virtual value of sine wave
		Accuracy	±1%±3 digits
		Resolution	4V range: 1mV 40V range: 10mV 400V range: 100mV
	DCA	Accuracy	40mA range: ±1%±1 digit 400mA range: ±1.5%±1 digit 20A range: ±3%±3 digits
		Resolution	40mA range: 10uA 400mA range: 100uA 20A range: 10mA
	ACA	Accuracy	40mA range: ±1.5%±3 digit 400mA range: ±2 %±1 digit 20A range: ±5%±3 digits
		Resolution	40mA range: 10uA 400mA range: 100uA 20A range: 10mA
	Resistance	Accuracy	400Ω range: ±1%±3 digits 4kΩ~4MΩ range: ±1%±1 digit 40MΩ range: ±1.5%±1 digit
		Resolution	400Ω range: 0.1Ω 4kΩ range: 1Ω 40kΩ range: 10Ω 400kΩ range: 100Ω 4MΩ range: 1kΩ 40MΩ range: 10kΩ
	Capacitance	Accuracy	±3%±3 digits
		Resolution	51.2nF range: 10pF 512nF range: 100pF 5.12uF range: 1nF 51.2uF range: 10nF 100uF range: 100nF
	Diode	Reading range	0V~1.5V On/Off measurement < 50 (±30) beeping
	Continuity	Threshold	< 30Ω
General	Display	Type	3.8" color liquid crystal display
		Resolution	320 (horizontal) ×240 (vertical) pixels
		Color	4096 colors
	Power	Consumption	< 6W
		Supply	100V~240V AC, 50/60Hz
		DC input	8.5VDC, 1500mA
	Environment	Operating	Temperature: 0 to 40 °C(32 to 104 °F) Relative humidity: < 75%
		Storage	Temperature: -20 to 60 °C(-4 to 140 °F) Relative humidity: < 75%
	Mechanical	Dimension	18 cm×11.5cm×4cm
		Weight	690g

Specifications are subject to change without notice.

Ordering Information

GDS-122 20MHz Handheld Digital Oscilloscope

Standard Accessories

Instruction Manual

Oscilloscope probe x 2
Multimeter test lead x 2
AC-DC adaptor
Probe adjustment tool
Soft Carrying case
Extension module for large current measurement
Extension module for small capacitance measurement
USB communication cable, CD-ROM (PC software)
1kHz square wave cable

ISO 9001

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